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Lembosia dianesei sp. nov. associated with *Peritassa campestris* in Minas Gerais, Brazil

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Abstract—A new *Lembosia* species is described in association with *Peritassa campestris* from a cerrado region of Minas Gerais, Brazil. The new species is described based on morphological characteristics and compared with other *Lembosia* species associated with celastraceous hosts.

Key words— *Ascomycota*, *Asterinaceae*, *Celastraceae*, cerrado

Introduction

The plant genus *Peritassa* Miers (*Celastraceae* R. Br.) includes nine species endemic to Brazil. These species are distributed across many Brazilian states and are found in the cerrado, cerradão, and campo ralo biomes. *Peritassa campestris* has been used pharmacologically, and the local population consumes the fruit in natura. However, since 2009 the leaves of some *P. campestris* plants in the Cristália and Botumirim municipalities of Minas Gerais have been found to have a black colored fungal colonization. This infection occurs most frequently during the rainy season. The fungal colonies have macroscopic characteristics similar to those of *Meliolales* Gäum. ex D. Hawksw. & O.E. Erikss. However, laboratory observations revealed that the fungus represents a species of *Lembosia* Lév., (*Asterinaceae* Hansf.). This genus is marked by the presence

of hyphopodiated mycelium, linear hysteriothecia with radiate upper walls, parallel bitunicate asci, and light brown bicellular ascospores (Bezerra 2004, Hofmann & Piepenbring 2014, Song & Hosagoudar 2003). Additionally, the identity of the host plant is required to distinguish *Lembosia* species (Inácio & Cannon 2003, Müller & von Arx 1962, Mebey & Hawksworth 1995). *Asterinaceae* are usually associated with tropical and subtropical plants around the globe (Hofmann & Piepenbring 2014, Guatimosim et al. 2015). Infection has been reported in wild plants but also occurs in cultivated plants, such as *Asterina manihotis* Syd. on living leaves on *Manihot esculenta* Crantz (Hofmann & Piepenbring 2008). New species of *Asterinaceae* have been described from Brazil, including *Lembosia bezerrae* Firmino & O.L. Pereira and *L. epidendri* Meir. Silva & O.L. Pereira (Silva & Pereira 2008, Firmino & Pereira 2014). Here we propose another new species, *Lembosia dianesei*, described and illustrated here.

Materials & methods

Peritassa campestris leaves were collected and sent to the Electron Microscopy and Ultrastructural Analysis Laboratory at the Universidade Federal de Lavras (LME/UFLA). Fragments and manual sections were mounted on slides in lactoglycerol for light microscopy examination of fungal structures. Melzer´s reagent was used to observe the amyloid zones of the asci. Permanent slides were made using PVLG (Polyvinyl alcohol-lactic acid-glycerol). Observations were made with a Leica DM2000 bright field vertical microscope using LAS v.4.5 software.

The leaf fragments used for scanning electron microscopy studies were fixed in Karnovsky solution (pH 7.2), post-fixed with 1.0% osmium tetroxide solution, and dehydrated in an acetone series (Bozzola & Russell 1999). The specimens were dried in a Bal-tec CPD 030 critical point dryer and coated with gold in a Bal-tec SCD 050 sputter coater for observation using the LEO EVO 40 and Smart Sem softwareat20 Kv scanning electron microscope with a working distance of 9 mm. Both light and scanning electron micrographs were edited in Corel Draw X7.

Two representative specimens were deposited in the herbarium of the Universidade Federal de Viçosa, Minas Gerais, Brazil (VIC).

Taxonomy

Lembosia dianesei M.P. Melo, J.L. Bezerra, S.I. Moreira & E. Alves, **sp. nov.** Pl. 1

MycoBank MB 814528

Differs from *Lembosia albersii* by its smaller asci and its supra-median ascospore septum; and from *L. lophopetali* and *L. salaciae* by its smaller asci and its shorter unicellular hyphopodia.

Type: Brazil, Minas Gerais, Cristália, on living leaves of *Peritassa campestris* (Cambess.) A.C. Sm. (*Celastraceae*), 30 July 2015, M.P. Melo (**Holotype**, VIC 42934).

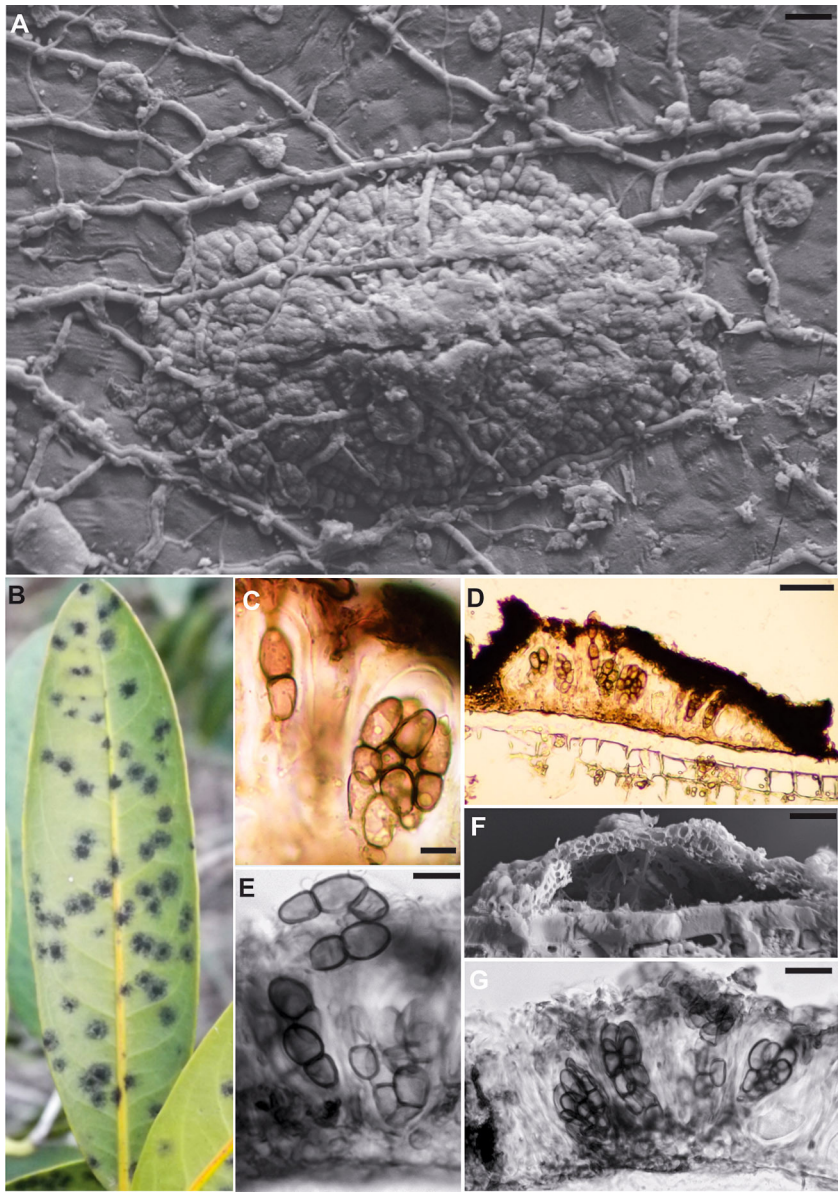

Plate 1. *Lembosia dianesei* (VIC 42934) on *Peritassa campestris*. A: hysteriothecia and mycelium (SEM). B: epiphyllous colonies. C, G: asci and ascospores. D, E: section through ascoma. F: uniseptate ascospores, constricted at the septum. Scale bars: A, F = 10 µm; C–E, G = 40 µm.

Etymology: In honor of the Brazilian mycologist, José Carmine Dianese.

Colonies epiphyllous, irregular or circular, single or confluent, black color, hyphae straight flexuous, branched at 45° angle, brown, septate, hyphal cells cylindrical 3.4–5.3 µm diam., smooth. Hyphopodia (appressoria) numerous, lateral, alternated and unilaterally distributed, nodule-shaped, unicellular, 4.5–7.1 × 4.7–6.6 µm, brown, penetration peg central on the appressorial cell. No haustoria were observed. Ascomata superficial, hysteriothecia, single to confluent, fringed at margins, linear or Y–X shaped, 150–335 × 130–160 µm, with a height of 29–70.5 µm, opening by a longitudinal dehiscence, dark brown; upper wall of textura prismatica, cells radiating, rectangular, 6.5–13.2 µm thick, brown; basal wall 3.5–16.3 µm thick. ASCI bitunicate, disposed as an upright palisade layer, ellipsoid to subglobose, 8-spored, hyaline to brown, 28.7–36.3 × 14.4–19.2 µm. Ascospores oblong to ellipsoid, ends rounded, straight, 1-septate, slightly constricted at the supra-median septum, hyaline when young and brown at maturity, smooth, conglobed, 19.7–28.7 × 6.8–10 µm; apical cell smaller, basal cell larger and thinner. Asexual morph not seen.

Additional specimen examined: **BRAZIL**, **Minas Gerais**, **Botumirim,** on living leaves of *Peritassa campestris*, 30 July 2015, M.P. Melo (VIC 42935).

Comments

Three *Lembosia* species have been previously reported in association with living leaves of celastraceous hosts: *L. salaciae* Hosag. & Archana, associated with *Salacia* sp. from India (Hosagoudar & Archana 2009); *L. albersii* Henn., associated with *Elaeodendron* sp. from Tanzania (Hennings 1902); and *L. lophopetali* (Rehm) Hansf., associated with *Lophopetalum toxicum* from the Philippines (Hansford 1949). Three additional records of *Lembosia* spp. have been reported from Brazil associated with living leaves of undetermined (or unstated) celastraceous hosts (Farr & Rossman 2015).

The three previously described species are easily distinguished from *Lembosia dianesei* (Table 1): *L. albersii* differs by its larger asci and its median ascospore septum (Hennings 1902); *L. lophopetali* differs by its longer two-celled hyphopodia, its larger asci, and its wider ascospores (Hansford 1949); and *L. salaciae* differs by its longer two-celled hyphopodia and its larger ascomata, asci, and ascospores (Hosagoudar & Archana 2009). Another peculiar characteristic of *Lembosia dianesei* is its strong hyphal adherence to the foliar surface.

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Table 1. Comparisons of hosts and morphology in *Lembosia* species associated with *Celastraceae*

Species	Host	Hyphopodia (µm)	Ascomata (µm)	Asci (µm)	Ascospores (µm)
L. dianesei	*Peritassa campestris*	4.5–7.1	205–335 × 130–160	28.7–36.3 × 14.4–19.2	19.7–28.7 × 6.8–10
L. salaciae	*Salacia* sp.	9–18	500–560 × 250–300	32–42 × 26–35	28–35 × 12–18
L. albersii	*Elaeodendron* sp.	—	—	45–90 × 20–30	20–30 × 10–12
L. lophopetali	*Lophopetalum toxicum*	—	—	40–50 × 20–25	25–30 × 11–14

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